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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/089,497	08/21/2002	Steven M Blair	4407.1US	9592

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TraskBritt  
P O Box 2550  
Salt Lake City, UT 84110

EXAMINER
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CHIN, CHRISTOPHER L

ART UNIT	PAPER NUMBER
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1641

DATE MAILED: 05/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/089,497

Applicant(s)

BLAIR, STEVEN M

Examiner

Christopher L. Chin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 29 and 30 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 26-28 is/are allowed.
- 6) ☒ Claim(s) 1-4, 7, 8, 10, 12-16 and 19 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 9, 11, 17, 18 and 20-26 is/are objected to.
- 8) ☒ Claim(s) 1-30 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/10/03 & 7/25/02.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election without traverse of Group I – claims 1-28 in the reply filed on 2/3/06 is acknowledged.

Claims 29-30 are withdrawn from consideration.

***Claim Rejections - 35 USC § 112***

2. Claims 14 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 is vague. In line 2, "surface1"?

Claim 16 is vague as to how the biosensor is "configured" to detect mass or fluorescence. The recitation of "configured" is not an actual limitation that describes how the biosensor has been modified to detect mass or fluorescence.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

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only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 3, and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Stone et al.

Stone et al (US Patent 5,742,633) discloses an asymmetric resonant optical cavity constructed of an optically transmissive dielectric material having an index of refraction  $n$ . The cavity may be in the form of a cylinder with a cross-section deformed from circularity or a spheroid with an oblate or prolate deformation (col. 2, lines 36-40).

The resonant optical cavity of Stone et al is not disclosed as a biosensor. However, the instant biosensor only comprises a resonant optical cavity as set forth in claim 1. Thus, any resonant optical cavity, such as the resonant optical cavity disclosed in Stone et al, anticipates the instant biosensor.

5. Claims 1, 3, 4, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Pipino.

Pipino (US Patent 5,835,231) discloses a resonant optical cavity. The cavity is fabricated from highly transparent optical material to form a stable resonator for ray trajectories sustained by total internal reflection. The cavity can be used to form an intra-cavity total reflection apparatus for high sensitivity measurement of the optical absorption of a test material. The apparatus includes an injecting means for producing light of a predetermined length of time; a closed stable optical cavity comprising an internal total reflecting surface for receiving the light within the cavity and for providing

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total internal reflection of the light at the external surface so as to generate a plurality of evanescent waves which emanate from the cavity at spaced points and which decay within a length outside of said cavity beyond the surface, the test material can be disposed outside of the cavity with the decay length of one or more of the evanescent waves; and a measuring means for monitoring the circulating light to determine the decay time of the light. The cavity has one of a polygonal, spherical, cylindrical, or toroidal shape. The injecting means includes at least one lens for transverse mode matching the light. The cavity is preferably made of fused silica (cols 2-3).

The resonant optical cavity of Pipino is not disclosed as a biosensor. However, the instant biosensor only comprises a resonant optical cavity as set forth in claim 1. Thus, any resonant optical cavity, such as the resonant optical cavity disclosed in Pipino, anticipates the instant biosensor.

6. Claims 1, 2, 10, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Stewart.

Stewart (US Patent 4,857,273) discloses a biosensor with a resonant optical cavity for performing immunoassays. Coupling prism (3) directs light from a light source into a planar waveguide (1). Planar waveguide (1) is considered a resonant optical cavity and coupling prism (3) is considered a transmission port (col. 2).

7. Claims 1, 3, 10, 12-16, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu.

Liu (US Patent 6,020,207) discloses liquid core optical waveguide for detection of a chemical species of interest. The waveguide comprises a capillary tube (12) of optically transparent material coated on its exterior surface with an amorphous polymer material (14) having a refractive index which is lower than that of the core liquids that are to be employed (i.e. liquids which will fill the inside of the capillary). The capillary tube is considered a resonant optical cavity. Optical fibers (18) and (20) on either side the capillary tube (12) are respectively used as input and output light conduits. As shown in Figures 1 and 2, sensing molecules (24) are immobilized on the interior wall surface (26) of capillary (12) (see cols. 2-3).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu or Pipino.

See above for the teachings of Liu and Pipino.

The resonant optical cavities of Liu and Pipino differ from the instant invention in failing to disclose the specific diameters recited in instant claims 7 and 8.

However, the optimum diameter of the resonant optical cavities in Liu and Pipino can be determined by routine experimentation and thus would have been obvious to one of ordinary skill in the art.

***Allowable Subject Matter***

10. Claims 26-28 are allowed.

11. Claims 5, 6, 9, 11, 17, 18, and 20-26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


US Patents 5,340,715 and 5,766,957 also disclose biosensors with resonant optical cavities.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher L. Chin whose telephone number is (571) 272-0815. The examiner can normally be reached on Monday-Thursday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Christopher L. Chin  
Primary Examiner  
Art Unit 1641

4/30/06